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INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS CORP. LOCATION Post Office Box P OAK RIDGE, TENN.

Special Hazards Committee

TO E. D. Flickinger
LOCATION K-303-7

REPORT NO. K-3661

DATE April 28, 1947

ANSWERING LETTER DATE

ATTENTION

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SUBJECT Alpha Contamination in the K-1303 Recovery Process

KZ-

An Alpha Radiation Survey of the Recovery Process in the K-1303 Building was made by the Process Laboratory at the request of Radiation Hazards. As a result of the study, specific safety measures are recommended to safeguard the health of the operators in this Area.

The toxicity of uranium due to the alpha activity has become a predominant factor in health considerations. Active material can enter the body by breathing contaminated air, swallowing, and through abrasions of the skin. It is the policy on the Manhattan District to limit to extremely low values the quantity of alpha emitters ingested by personnel. In general, this is to be accomplished either by limiting surface and atmospheric alpha count to normal background levels, or taking of extreme protective measures. In many cases, a combination of the two is required.

With respect to the recovery processes in K-1303, it appears feasible to control the health hazard by establishing two types of areas:

(1). A "safe" area in which all operations are sufficiently enclosed or of such a nature that the possibility of spillage, or contaminating the atmosphere, or surfaces handled by personnel would be sufficiently remote that extensive protective equipment would not be necessary. In such an area, those processes that involved the dusting or spraying of uranium compounds would be completely enclosed in a tight housing.

This document has been approved for release to the public by: [signature] 4/19/96 Date
Technical Information Officer
Oak Ridge K-25 Site

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Carbide and Carbon Chemicals Corporation, Operating Contractor for the U.S. Atomic Energy Commission.

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(2). Areas are to be designated as "hot" in which the processes are of such a nature that the contamination of the area cannot be prevented. Personnel entering a "hot" area would be required to wear protective equipment such as gas mask or respirator, rubber gloves, and special clothing.

This report is concerned at this time with locations that are definitely "hot" and require immediate attention.

For this survey both air and surface readings were taken at many stages of recovery process, in order to achieve a comprehensive understanding of the origin and extent of the problem.

A. OPERATION OF GRINDING T_3O_8

This operation has been performed at various locations.

Results of Survey - A maximum air count of 71 times tolerance was found. Surface counts were frequently beyond range of the instrument. Full scale reading on the Zeuto alpha counter, which has a probe area of 0.1 square foot, is equivalent to about 20,000 counts per minute. Air samples indicated an unsafe condition for longer than four hours after cleaning the grinder.

Recommendations

(1). The grinder should be moved to the scale room in the 1301 Building.

(2). The cubicle containing both the scale and grinder should then be designated as a "hot" area.

(3). Respirator or mask and rubber gloves should be worn at all times in this cubicle.

(4). Extra coveralls and shoes should be kept for men who are to enter the grinding and scale room, and they should wear these clothes only in this room. Such practice would aid materially in confining alpha particles to the areas in which they originate.

(5). It would be desirable, if at all possible, to enclose the grinder in an air-tight box. In the event that a dust proof container for the grinder can be devised, it may be possible to omit the clothing change.

B. FURNACE ROOM FOR FURNACING URANIUM PRECIPITATES

Results of Survey - Air samples taken between operations were all below tolerance, but surface counts were high.

Recommendations

(1). Rubber gloves and a respirator should be worn while operators are in this cubicle.

(2). A thorough decontamination and caution in handling material would help to keep the surface count down.

C. FILTER PRESS CUBICLE FOR SEPERATING URANIUM PRECIPITATES FROM FILTRATE

Results of Survey - Air samples indicated up to 19 times tolerance. Surface counts were far above background, probably due to spills.

Recommendations

(1). This area should be designated as "hot".

(2). Rubber gloves and a respirator are required here.

(3). Decontaminating and painting the walls to a level of about six feet above the floor, and painting the floor and wooden stand, would facilitate the clean up of spills.

GENERAL RECOMMENDATIONS

It is evident from the results obtained from the survey, that firm measures are necessary to keep operators from inhaling, or coming in contact with, process material.

For "Hot" Areas

(1). Large signs at the entrance to the previously listed cubicles should indicate the type of location and the necessary equipment to be worn before entering.

(2). Respirators and rubber gloves should be worn in such hot areas.

(3). Smoking, eating, and the storing of food should be forbidden in these areas.

(4). Personnel should wash frequently, especially before eating, smoking, or leaving work. Washing, in this case, consists of thorough scrubbing with a stiff bristle brush, and the use of a strong soap with large quantities of water.

For All Locations in K-1303 Not Previously Listed

(1). All personnel who normally work in this area should be kept on the medical recheck list.

(2). Protective equipment should be used whenever contamination is visible.

The survey of other operations in the K-1300 Area is being continued to determine the necessity for any further safeguards. The operations already studied will also be monitored.

RADIATION HAZARDS

Gerald J. Selvin

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APPROVED: S. Visner

S. Visner

GJS/ljh